

CLAIMS

1. Device for producing an electric field between
a first electrode (25) and a second electrode (27),
5 comprising:

- means for applying a potential difference
between these two electrodes (25, 27), allowing to
obtain, if this potential difference is applied alone,
a predetermined value of electric field in the vicinity
10 of the first electrode (25),

- means forming modulation electrode (28, 29)
located near to the first electrode (25), either in the
same plane, or so that the first electrode is inserted
between the second electrode and said means forming
15 modulation electrode,

- means of control for applying a potential
difference between the means forming modulation
electrode (28, 29) and the first electrode (25) in
order to obtain through the contribution of said
20 potential differences another predetermined value of
electric field in said vicinity of the first electrode
(25).

2. Device according to claim 1, characterized in
25 that the means for applying a potential difference
between the first (25) and the second electrode (27)
and the control means supply potential differences such
that the value of the electric field in said vicinity
of the first electrode (25) is greater than the value
30 which would be due to the potential difference alone
between the first (25) and the second electrode (27).

3. Device according to claim 1, characterized in that the means for applying a potential difference between the first (25) and the second electrode (27) and the control means supply potential differences so that the value of the electric field in said vicinity of the first electrode (25) is lower than the value which would be due to the potential difference alone between the first (25) and the second electrode (27).

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4. Device according to any one of claims 1 to 3, characterized in that the first (25) and the second electrode (27) and the means forming modulation electrode (28, 29) are arranged in parallel.

5. Device according to any one of claims 1 to 4, characterized in that the means forming modulation electrode comprise two electrodes (28, 29) surrounding the first electrode (25).

6. Device according to claim 1 characterized in that when the first electrode is inserted between the second electrode and the means forming modulation electrode, the means forming modulation electrode is made up of a single electrode.

7. Process for producing an electric field between a first electrode (25) and a second electrode (27), comprising:

- the application of a potential difference between the first (25) and the second electrode (27) so

as to obtain, if this potential difference was applied alone, a predetermined value of electric field in the vicinity of the first electrode (25),

- the application of a potential difference
5 between the first electrode (25) and means forming modulation electrode (28, 29) and located near to the first electrode (25), either in the same plane or so that the first electrode is inserted between the second electrode and said means forming modulation electrode,
10 in order to obtain in association with the electric field due to the application of the potential difference between the first (25) and the second electrode (27), another predetermined value of electric field.

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8. Process according to claim 7, characterized in that the application of the potential difference between the first (25) and the second electrode (27) is such that, if this potential difference was applied
20 alone, the electric field in said vicinity of the first electrode (25) would be greater than said other predetermined value.

9. Process according to claim 7, characterized in
25 that the application of the potential difference between the first (25) and the second electrode (27) is such that, if this potential difference was applied alone, the electric field in said vicinity of the first electrode (25) would be lower than said other
30 predetermined value.

10. Field emission screen comprising an anode plate (32) and a cathode plate (31) facing one another, the anode plate (32) comprising, on its internal surface of the screen, at least one electrode (37) supporting phosphor means (20), the cathode plate (31) comprising on its internal surface of the screen at least one electrode emitting electrons (35) at least partially facing the anode electrode (37), this cathode electrode (35) becoming emitter of electrons when the electric field in its vicinity exceeds a threshold value, the screen also comprising application means for a potential difference between said anode electrode (37) and said cathode electrode (35), characterized in that the screen further comprises means forming modulation electrode (38, 39) located in the vicinity of the cathode electrode (35), either on the same plane or so that the cathode electrode (35) is inserted between the anode electrode (37) and said means forming modulation electrode, the screen also comprising control means for applying a potential difference between the cathode electrode (35) and the means forming modulation electrode (38,39), the means for applying potential differences is such that it provides for obtaining in said vicinity of the cathode electrode a predetermined value of electric field resulting from the contribution of said potential differences, said predetermined value being as one wishes either lower than said threshold value, or greater than said threshold value.

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11. Display screen according to claim 10, characterized in that the means for applying a potential difference between said anode electrode (37) and said cathode electrode (35) is such that, in the
5 absence of a potential difference applied between the cathode electrode (35) and the means forming modulation electrode (38, 39), said predetermined value of electric field is lower than said threshold value.

10 12. Display screen according to claim 10, characterized in that the means for applying a potential difference between said anode electrode (37) and said cathode electrode (35) is such that, in the absence of potential difference applied between the
15 cathode electrode (35) and the means forming modulation electrode (38, 39), said predetermined value of electric field is greater than said threshold value.

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13. Display screen according to any one of claims
20 10 to 12, characterized in that the means forming modulation electrode comprises two electrodes (38, 39) surrounding said cathode electrode (35).

14. Display screen according to any one of claims
25 10 to 12, characterized in that, as said cathode electrode is located between said anode electrode and the means forming modulation electrode, the means forming modulation electrode (50) is made up of a single electrode.

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15. Display screen according to any one of claims 10 to 12, characterized in that, as said cathode electrode is located between said anode electrode and the means forming modulation electrode, said cathode electrode (35) and the means forming modulation electrode (38, 39) are separated by a layer of insulating material (34).

16. Display screen according to any one of claims 10 to 15, characterized in that as said cathode electrode (35) comprises a conductor element on which is deposited a layer of emissive material (30).

17. Display screen according to claim 16, characterized in that the layer of emissive material (47) is separated from said conductor element (45) by a resistive film (46).

18. Display screen according to claim 17, characterized in that the layer of emissive material (77) only covers part of the resistive film (76).

19. Display screen according to claim 17, characterized in that the emissive material (97) is a material deposited on the resistive film (96) by means of a catalyst material (92) deposited on the resistive film (96) and on which the emissive material (97) settles preferentially.

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20. Display screen according to any one of claims 10 to 19, characterized in that it is of the matrix

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type, the crossing of lines and columns defining pixels.

21. Display screen according to claim 10,
5 characterized in that the anode plate comprises a common electrode with phosphor means, the cathode plate (81) comprises a plate (83) with conductor lines (Y_i, Y_j, Y_k) constituting the means forming modulation electrode, covered with a layer of dielectric material
10 (84), the layer of dielectric material supporting conductor columns (85), the lines and columns forming a matrix arrangement connected to addressing means and defining pixels, the conductor columns having an emissive material (87).

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22. Display screen according to claim 21, characterized in that each pixel corresponds to the crossing of a line (Y_i, Y_j, Y_k) and several conductor columns (85).

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23. Display screen according to claims 21 or 22, characterized in that the conductor lines (Y_i, Y_j, Y_k) comprise windows (80) facing the conductor columns (85), the emissive material (87) supported by the
25 conductor columns being only present on the areas of the conductor columns corresponding to the windows (80).

24. Process for the use of a field emission
30 display screen comprising at least one anode electrode (37) and at least one cathode electrode (35) facing one

another, the cathode electrode comprising an emissive material (30) emitting electrons when the electric field in the vicinity of the cathode electrode (35) exceeds a threshold value, characterized in that, in order to obtain an emission of electrons from the emissive material, it comprises:

- the application of a potential difference between the anode electrode (37) and the cathode electrode (35) so as to obtain in the vicinity of the cathode electrode, if this potential difference was applied alone, an electric field of lower value than said threshold value;

- the application of a potential difference between the cathode electrode (35) and the means forming modulation electrode (38, 39) located near the cathode electrode, either in the same plane or so that the cathode electrode is inserted between the anode electrode and said means forming modulation electrode, so as to obtain in said vicinity of the cathode electrode, in association with the electric field due to the application of the potential difference between the anode (37) and cathode (35) electrodes, an electric field value greater than said threshold value.

25 25. A process for the use of a field emission display screen comprising at least one anode electrode (37) and at least one cathode electrode (35) facing one another, the cathode electrode comprising an emissive material (30) emitting electrons when the electric field in the vicinity of the cathode electrode (35) exceeds a threshold value, characterized in that, in

order to avoid an emission of electrons from the emissive material, it comprises:

- the application of a potential difference between the anode electrode (37) and the cathode electrode (35) so as to obtain in the vicinity of the cathode electrode, if this potential difference was applied alone, an electric field of greater value than said threshold value,

- the application of a potential difference between the cathode electrode (35) and means forming modulation electrode (38, 39) located in the vicinity of the cathode electrode, either in the same plane or so that the cathode electrode is inserted between the anode electrode and said means forming modulation electrode, so as to obtain in said vicinity of the cathode electrode, in association with the electric field due to the application of the potential difference between the anode (37) and cathode (35) electrodes, an electric field value lower than said threshold value.